WHAT IS CLAIMED IS:

1. A system for effectively populating a dither matrix, comprising:

a dither tile configured to include tile cells that each correspond to one of a plurality of tile threshold values from said dither matrix;

a frame area that is configured to include a plurality of frame cells that are positioned around said dither tile to collectively encompass said tile cells of said dither tile in an adjacent manner; and

a design entity that reiteratively evaluates candidate cell placements for said tile cells by utilizing a cost function to evaluate both said dither tile and said frame area, said design entity selecting a series of optimal candidate cell placements for said tile cells, said design entity responsively assigning corresponding ones of said plurality of tile threshold values to said tile cells to thereby populate said dither matrix.

2. The system of claim 1 wherein said dither matrix is utilized by a printer device to perform a dithering procedure to thereby reproduce image data in an optimal manner.

3. The system of claim 1 wherein said design entity accesses an appropriate image data pattern to utilize as a frame marking matrix for marking said plurality of frame cells from said frame area.

4. The system of claim 3 wherein said frame marking matrix is optimally selected to produce a dithered image with a uniform visual appearance.

5. The system of claim 3 wherein said design entity sets a current dither tile value corresponding to a current dither tile to be equal to a half-on state in which cell locations for one-half of said tile cells are designated.

6. The system of claim 5 wherein said design entity selects one of said candidate cell placements corresponding to said current dither tile.

7. The system of claim 6 wherein said design entity creates a minus-one image frame corresponding to said frame area, said minus-one image frame having frame threshold values that are equal to said current dither tile value minus one for each of said plurality of frame cells.

8. The system of claim 7 wherein said design entity generates a minus-one marked frame for said frame area by marking selected ones of said plurality of frame cells after comparing corresponding cell values from said frame marking matrix with said frame threshold values from said minus-one image frame.

9. The system of claim 8 wherein said design entity determines a minus-one cost function that includes both said current dither tile with said one of said candidate cell placements and said minus-one marked frame.

10. The system of claim 9 wherein said design entity creates a plus-one image frame corresponding to said frame area, said plus-one image frame having said frame threshold values that are equal to said current dither tile value plus one for each of said plurality of frame cells.

11. The system of claim 10 wherein said design entity generates a plus-one marked frame for said frame area by marking selected ones of said plurality of frame cells after comparing said corresponding cell values from said frame marking matrix with said frame threshold values from said plus-one image frame.

12. The system of claim 11 wherein said design entity determines a plus-one cost function that includes both said current dither tile with said one of said candidate cell placements and said plus-one marked frame.

13. The system of claim 12 wherein said cost function evaluates image uniformity properties by utilizing human visual system characteristics including pattern angles and pattern frequencies.

14. The system of claim 12 wherein said design entity determines and stores a combined cost function for said candidate cell placement that represents both said minus-one cost function and said plus-one cost function.

15. The system of claim 14 wherein said design entity reiteratively evaluates all remaining ones of said candidate cell placements for said current dither tile to produce a series of respective combined cost functions that each correspond to a different one of said candidate cell placements for said current dither tile.

16. The system of claim 15 wherein said design entity selects an optimal cell corresponding to a best combined cost function from among said candidate cell placements for said current dither tile, said design entity also assigning a respective one of said tile threshold values to said optimal cell.

17. The system of claim 16 wherein said design entity determines whether an ascending process is current in progress for populating said dither matrix, said design entity responsively incrementing said current dither tile value by one if said ascending process is currently in progress, said design entity then repeatedly evaluating new sets of said candidate cell placements for ascending current dither tiles until said current dither tile value equals a total number of said plurality of tile cells minus one.

18. The system of claim 17 wherein said design entity determines whether a descending process is current in progress for populating said dither matrix, said design entity responsively decrementing said current dither tile value by one if said descending process is currently in progress, said design entity then repeatedly evaluating said new sets of said candidate cell placements for descending current dither tiles until said current dither tile value equals zero.

19. The system of claim 1 wherein said design entity includes a matrix design program that is executed on a design computer.

20. The system of claim 2 wherein said printer device tiles said dither matrix in said dither tile across a page of image data to perform a dither procedure in which each of said plurality of tile threshold values is compared against a corresponding image data cell value, said printer device marking a corresponding print location only when said each of said plurality of said tile threshold values from said dither matrix is less than said corresponding image data cell value.

21. A method for effectively populating a dither matrix, comprising the steps of:

providing a dither tile that is configured to include tile cells that each correspond to one of a plurality of tile threshold values from said dither matrix;

generating a frame area that is configured to include a plurality of frame cells that are positioned to collectively encompass said tile cells of said dither tile in an adjacent manner; and

evaluating candidate cell placements for said tile cells with a design entity by reiteratively utilizing a cost function to evaluate both said dither tile and said frame area, said design entity selecting a series of optimal candidate cell placements for said tile cells, said design entity responsively assigning corresponding ones of said plurality of tile threshold values to said tile cells to thereby populate said dither matrix.

22. The method of claim 21 wherein said dither matrix is utilized by a printer device to perform a dithering procedure to thereby reproduce image data in an optimal manner.

23. The method of claim 21 wherein said design entity accesses an appropriate image data pattern to utilize as a frame marking matrix for marking said plurality of frame cells from said frame area.

24. The method of claim 23 wherein said frame marking matrix is optimally selected to produce a dithered image with a uniform visual appearance.

25. The method of claim 23 wherein said design entity sets a current dither tile value corresponding to a current dither tile to be equal to a half-on state in which cell locations for one-half of said tile cells are designated.

26. The method of claim 25 wherein said design entity selects one of said candidate cell placements corresponding to said current dither tile.

27. The method of claim 26 wherein said design entity creates a minus-one image frame corresponding to said frame area, said minus-one image frame having frame threshold values that are equal to said current dither tile value minus one for each of said plurality of frame cells.

28. The method of claim 27 wherein said design entity generates a minus-one marked frame for said frame area by marking selected ones of said plurality of frame cells after comparing corresponding cell values from said frame marking matrix with said frame threshold values from said minus-one image frame.

29. The method of claim 28 wherein said design entity determines a minus-one cost function that includes both said current dither tile with said one of said candidate cell placements and said minus-one marked frame.

30. The method of claim 29 wherein said design entity creates a plus-one image frame corresponding to said frame area, said plus-one image frame having said frame threshold values that are equal to said current dither tile value plus one for each of said plurality of frame cells.

31. The method of claim 30 wherein said design entity generates a plus-one marked frame for said frame area by marking selected ones of said plurality of frame cells after comparing said corresponding cell values from said frame marking matrix with said frame threshold values from said plus-one image frame.

32. The method of claim 31 wherein said design entity determines a plus-one cost function that includes both said current dither tile with said one of said candidate cell placements and said plus-one marked frame.

33. The method of claim 32 wherein said cost function evaluates image uniformity properties by utilizing human visual system characteristics including pattern angles and pattern frequencies.

34. The method of claim 32 wherein said design entity determines and stores a combined cost function for said candidate cell placement that represents both said minus-one cost function and said plus-one cost function.

35. The method of claim 34 wherein said design entity reiteratively evaluates all remaining ones of said candidate cell placements for said current dither tile to produce a series of respective combined cost functions that each correspond to a different one of said candidate cell placements for said current dither tile.

36. The method of claim 35 wherein said design entity selects an optimal cell corresponding to a best combined cost function from among said candidate cell placements for said current dither tile, said design entity also assigning a respective one of said tile threshold values to said optimal cell.

37. The method of claim 36 wherein said design entity determines whether an ascending process is current in progress for populating said dither matrix, said design entity responsively incrementing said current dither tile value by one if said ascending process is currently in progress, said design entity then repeatedly evaluating new sets of said candidate cell placements for ascending current dither tiles until said current dither tile value equals a total number of said plurality of tile cells minus one.

38. The method of claim 37 wherein said design entity determines whether a descending process is current in progress for populating said dither matrix, said design entity responsively decrementing said current dither tile value by one if said descending process is currently in progress, said design entity then repeatedly evaluating said new sets of said candidate cell placements for descending current dither tiles until said current dither tile value equals zero.

39. The method of claim 21 wherein said design entity includes a matrix design program that is executed on a design computer.

40. The method of claim 22 wherein said printer device tiles said dither matrix in said dither tile across a page of image data to perform a dither procedure in which each of said plurality of tile threshold values is compared against a corresponding image data cell value, said printer device marking a corresponding print location only when said each of said plurality of said tile threshold values from said dither matrix is less than said corresponding image data cell value.

41. The method of claim 1 wherein said frame area is implemented to include minus frame spacing deviations and plus frame spacing deviations that are greater than one cell value away from a current tile cell value

42. The method of claim 1 wherein said frame area is implemented by utilizing previous versions of existing frames from earlier iterations that may be evaluated by selecting an optimal frame area where said cost function is less than a pre-determined variation value.

43. A computer-readable medium comprising program instructions for effectively populating a dither matrix by performing the steps of:

providing a dither tile that is configured to include tile cells that each correspond to one of a plurality of tile threshold values from said dither matrix;

generating a frame area that is configured to include a plurality of frame cells that are positioned to collectively encompass said tile cells of said dither tile in an adjacent manner; and

evaluating candidate cell placements for said tile cells with a design entity by reiteratively utilizing a cost function to evaluate both said dither tile and said frame area, said design entity selecting a series of optimal candidate cell placements for said tile cells, said design entity responsively assigning corresponding ones of said plurality of tile threshold values to said tile cells to thereby populate said dither matrix.

44. A system for effectively populating a dither matrix, comprising:

means for providing a dither tile that is configured to include tile cells that each correspond to one of a plurality of tile threshold values from said dither matrix;

means for generating a frame area that is configured to include a plurality of frame cells that are positioned to collectively encompass said tile cells of said dither tile in an adjacent manner; and

means for evaluating candidate cell placements for said tile cells by reiteratively utilizing a cost function to evaluate both said dither tile and said frame area, said means for evaluating then selecting a series of optimal candidate cell placements for said tile cells, said means for evaluating responsively assigning corresponding ones of said plurality of tile threshold values to said tile cells to thereby populate said dither matrix.

45. A method for effectively populating a dither matrix, comprising the steps of:

providing a dither tile that is configured to include tile cells that each correspond to one of a plurality of tile threshold values from said dither matrix;

generating a frame area that is configured to include a plurality of frame cells that are positioned to encompass said tile cells of said dither tile; and

analyzing candidate cell placements for said tile cells with a design entity to evaluate both said dither tile and said frame area, said design entity responsively assigning corresponding ones of said plurality of tile threshold values to said tile cells to thereby populate said dither matrix.